IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A sulfonamide compound of the formula (I):

$$R^1\text{-}SO_2NHCO\text{-}A\text{-}X\text{-}R^2 \quad (I)$$

wherein

R^1 is an optionally substituted alkyl, an optionally substituted alkenyl, an optionally substituted alkynyl, an optionally substituted cyclo(lower)alkyl, an optionally substituted aryl or an optionally substituted heterocyclic group;

A is an optionally substituted heteropolycyclic group in which sulfur is the only heteroatom(s) ~~except benzimidazolyl, indolyl, 4,7-dihydrobenzimidazolyl and 2,3-dihydrobenzoxazinyl~~;

X is an alkylene, an oxa, an oxa(lower)alkylene, a lower alkylene-oxa, a carbonyl, a lower alkenylene, an optionally substituted imino, an optionally N-substituted imino(lower)alkylene, an optionally N-substituted lower alkyleneimino, a thioxa(lower)-alkylene or a lower alkylenethioxa; and

R^2 is an optionally substituted aryl, an optionally substituted heterocyclic group or a substituted biphenylyl;

~~provided that when A is 3H-imidazo[4,5-b]pyridyl substituted by lower alkyl, R^2 is an optionally substituted aryl, an optionally substituted heterocyclic group or a biphenylyl substituted by a group other than tetrazolyl, and when A is quinolyl substituted by lower alkyl, R^2 is an optionally substituted aryl, an optionally substituted heterocyclic group, or a biphenylyl substituted by at least one group selected from the group consisting of alkyl, cyclo(lower)alkyl, alkenyl, allymyl, lower alkanoyl, lower alkoxy, phenyl, heterocycle(lower)alkyl other than substituted tetrazolylmethyl, halogen, amino, substituted amino, lower alkylsulfonyl, lower alkylsulfinyl, lower alkylthio, cyano, carbamoyl,~~

~~mono(lower)alkylcarbamoyl, di(lower)alkylcarbamoyl, nitro, halo(lower)alkyl, aryl(lower)alkyl, aryl(lower)alkenyl, aryl(lower)alkoxy, lower alkoxy substituted by substituted amino, cyclo(lower)alkyl(lower)alkoxy, cyclo(lower)alkyl(lower)alkyl, aryloxy(lower)alkyl, acyloxy(lower)alkyl, hydroxy(lower)alkyl, mono- or di(lower)alkylamino(lower)alkyl, aryl(lower)alkoxy(lower)alkyl, arylthio(lower)alkyl, heterocycle(lower)alkoxy, heterocycle-oxy(lower)alkyl, aryl(lower)alkylthio, arylureido, lower alkoxy(lower)alkoxy, aryl(lower)alkynyl, lower alkyl substituted by optionally substituted divalent heterocyclic group and optionally substituted heterocyclic group,~~ or a salt thereof.

Claim 2 (Currently Amended): The sulfonamide compound of claim 1, wherein,

R^1 is an optionally substituted alkyl, an optionally substituted alkenyl, an optionally substituted alkynyl, an optionally substituted cyclo(lower)alkyl, an optionally substituted aryl or an optionally substituted heterocyclic group, wherein, when these groups are substituted, the substituent is at least one member selected from the group consisting of alkyl, cyclo(lower)alkyl, alkenyl, alkenyl, lower alkanoyl, lower alkoxy, aryl, heterocycle(lower)alkyl, halogen, amino, substituted amino, lower alkylsulfonyl, lower alkylsulfonyl, lower alkylthio, cyano, carboxy, protected carboxy, carbamoyl, mono(lower)alkylcarbamoyl, di(lower)alkylcarbamoyl, nitro, halo(lower)alkyl, aryl(lower)alkyl, aryl(lower)alkenyl, aryl(lower)alkoxy, lower alkoxy substituted by substituted amino, cyclo(lower)alkyl(lower)alkoxy, cyclo(lower)alkyl(lower)alkyl, aryloxy(lower)alkyl, acyloxy(lower)alkyl; hydroxy(lower)alkyl, mono- or di(lower)alkylamino(lower)alkyl, aryl(lower)alkoxy(lower)alkyl, arylthio(lower)alkyl, heterocycle(lower)alkoxy, heterocycleoxy(lower)alkyl, aryl(lower)alkylthio, arylureido,

lower alkoxy(lower)alkoxy, aryl(lower)alkynyl, lower alkyl substituted by optionally substituted divalent heterocyclic group and optionally substituted heterocyclic group;

A is a heteropolycyclic group in which sulfur is the only heteroatom(s) ~~having at least one hetero atom of oxygen atom,~~ sulfur ~~atom, selenium atom and nitrogen atom, exclusive of benzimidazolyl, indolyl, 4,7-dihydrobenzimidazolyl and 2,3-dihydrobenzoxazinyl, said heterocyclic group being~~ which is optionally substituted by at least one member selected from the group consisting of alkyl, oxo, thioxo, halogen, lower alkoxy, lower alkylthio, cyclo(lower)alkyl, optionally substituted amino, aryl, heterocyclic group, lower alkylsulfonyl and lower alkylsulfonyl; and

R^2 is an optionally substituted aryl, an optionally substituted heterocyclic group or a substituted biphenylyl, wherein, when these groups are substituted, the substituent is at least one member selected from the group consisting of alkyl, cyclo(lower)alkyl, alkenyl, alkynyl, lower alkanoyl, lower alkoxy, aryl, heterocycle(lower)alkyl, halogen, amino, substituted amino, lower alkylsulfonyl, lower alkylsufonyl, lower alkylthio, cyano, carboxy, protected carboxy, carbamoyl, mono(lower)alkylcarbamoyl, di(lower)alkylcarbamoyl, nitro, halo(lower)alkyl, aryl(lower)alkyl, aryl(lower)alkenyl, aryl(lower)alkoxy, lower alkoxy substituted by substituted amino, cyclo(lower)alkyl(lower)alkoxy, cyclo(lower)alkyl(lower)alkyl, aryloxy(lower)alkyl, acyloxy(lower)alkyl, hydroxy(lower)alkyl, mono- or di(lower)alkylamino(lower)alkyl, aryl(lower)alkoxy(lower)alkyl, arylthio(lower)alkyl, heterocycle(lower)alkoxy, heterocycleoxy(lower)alkyl, aryl(lower)alkylthio, arylureido, lower alkoxy(lower)alkoxy, aryl(lower)alkynyl, lower alkyl substituted by optionally substituted divalent heterocyclic group and optionally substituted heterocyclic group;

~~provided that when A is 3H-imidazo[4,5-b]pyridyl substituted by lower alkyl, R^2 is optionally substituted aryl, optionally substituted heterocyclic group or biphenylyl substituted~~

~~by a substituent other than tetrazolyl, and when A is quinolyl substituted by lower alkyl, R^2 is optionally substituted aryl, optionally substituted heterocyclic group or substituted biphenylyl,~~

~~when the above-mentioned aryl and heterocyclic group are substituted, the substituent is at least one member selected from the group consisting of alkyl, cyclo(lower)alkyl, alkenyl, alkynyl, lower alkanoyl, lower alkoxy, phenyl, heterocycle(lower)alkyl, halogen, amino, substituted amino, lower alkylsulfonyl, lower alkylsulfinyl, lower alkylthio, cyano, carboxy, protected carboxy, carbamoyl, mono(lower)alkylcarbamoyl, di(lower)alkylcarbamoyl, nitro, halo(lower)alkyl, aryl(lower)alkyl, aryl(lower)alkenyl, aryl(lower)alkoxy, lower alkoxy substituted by substituted amino, cyclo(lower)alkyl(lower)alkoxy, cyclo(lower)alkyl(lower)alkyl, aryloxy(lower)alkyl, acyloxy(lower)alkyl, hydroxy(lower)alkyl, mono- or di(lower)alkylamino(lower)alkyl, aryl(lower)alkoxy(lower)alkyl, arylthio(lower)alkyl, heterocycle(lower)alkoxy, heterocyclic-oxy(lower)alkyl, aryl(lower)alkylthio, arylureido, lower alkoxy(lower)alkoxy, aryl(lower)alkynyl, lower alkyl substituted by optionally substituted divalent heterocyclic group and optionally substituted heterocyclic group, and~~

~~the substituent for the above-mentioned biphenylyl is at least one member selected from the group consisting of alkyl, cyclo(lower)alkyl, alkenyl, alkynyl, lower alkanoyl, lower alkoxy, phenyl, heterocycle(lower)alkyl other than substituted tetrazolylmethyl, halogen, amino, substituted amino, lower alkylsulfonyl, lower alkylsuffinyl, lower alkylthio, cyano, carbamoyl, mono(lower)alkylcarbamoyl, di(lower)alkylcarbamoyl, nitro, halo(lower)alkyl, aryl(lower)alkyl, aryl(lower)alkenyl, aryl(lower)alkoxy, lower alkoxy substituted by substituted amino, cyclo(lower)alkyl(lower)alkoxy, cyclo(lower)alkyl(lower)alkyl, aryloxy(lower)alkyl, acyloxy(lower)alkyl, hydroxy(lower)alkyl, mono- or di(lower)alkylamino(lower)alkyl, aryl(lower)alkoxy(lower)alkyl, arylthio(lower)alkyl,~~

~~heterocycle(lower)alkoxy, heterocyclic-oxy(lower)alkyl, aryl(lower)alkylthio, arylureido, lower alkoxy(lower)alkoxy, aryl(lower)alkynyl, lower alkyl substituted by optionally substituted divalent heterocyclic group and optionally substituted heterocyclic group,~~

or a salt thereof.

Claim 3 (Currently Amended): The sulfonamide compound of claim 2, wherein,

R^1 is an optionally substituted alkyl, an optionally substituted alkenyl, an optionally substituted alkynyl, an optionally substituted cyclo(lower)alkyl, an optionally substituted phenyl or an optionally substituted heterocyclic group, wherein when these groups are substituted, the substituent is at least one member selected from the group consisting of alkyl, cyclo(lower)alkyl, alkenyl, alkynyl, lower alkanoyl, lower alkoxy, phenyl, heterocycle(lower)alkyl, halogen, amino, lower alkanoylamino, mono(lower)alkylamino, di(lower)alkylamino, N-(lower) alkyl-N-acylamino, lower alkylsulfonylamino, aryl(lower)alkylamino, N-heterocycle-N-(lower)alkylamino, arylsulfonylamino, arylcarbonylamino, lower alkylsulfonyl, lower alkylsulfinyl, lower alkylthio, cyano, carboxy, protected carboxy, carbamoyl, mono(lower)alkylcarbamoyl, di(lower)alkylcarbamoyl, nitro, halo(lower)alkyl, aryl(lower)alkyl, aryl(lower)alkenyl, aryl(lower)alkoxy, lower alkanoylamino(lower)alkoxy, mono(lower)alkylamino(lower)alkoxy, di(lower)alkylamino(lower)alkoxy, N-(lower)alkyl-N-acylamino(lower)alkoxy, lower alkylsulfonylamino(lower)alkoxy, aryl(lower)alkylamino(lower)alkoxy, N-heterocycle-N-(lower)alkylamino(lower)alkoxy, arylsulfonylamino(lower)alkoxy, arylcarbonylamino(lower)alkoxy, cyclo(lower)alkyl(lower)alkoxy, cyclo(lower)alkyl(lower)alkyl, aryloxy(lower)alkyl, acyloxy(lower)alkyl, hydroxy(lower)alkyl, mono- or di(lower)alkylamino(lower)alkyl, aryl(lower)alkoxy(lower)alkyl, arylthio(lower)alkyl, heterocycle(lower)alkoxy, heterocycle-

oxy(lower)alkyl, aryl(lower)alkylthio, arylureido, lower alkoxy(lower)alkoxy, aryl(lower)alkynyl, lower alkyl substituted by optionally substituted divalent heterocyclic group and optionally substituted heterocyclic group; and

A is a heterodicyclic group in which sulfur is the only heteroatom(s) ~~of the following (A) to (1) exclusive of benzimidazolyl, indolyl, 4,7-dihydrobenzimidazolyl and 2,3-dihydrobenzoxazinyl, wherein said heterocyclic group is~~ which is optionally substituted by at least one member selected from the group consisting of alkyl, oxo, thioxo, halogen, lower alkoxy, lower alkylthio, cyclo(lower)alkyl, amino, lower alkanoylamino, mono(lower)alkylamino, di(lower)alkylamino, N-(lower)alkyl-N-acylamino, lower alkylsulfonylamino, aryl(lower)alkylamino, N-heterocycle-N-(lower)alkylamino, arylsulfonylamino, arylcarbonylamino, aryl, heterocyclic group, lower alkylsulfonyl and lower alkylsulfinyl,

~~provided that when A is 3H-imidazo[4,5-b]pyridyl substituted by lower alkyl, R^2 is an optionally substituted aryl, optionally substituted heterocyclic group or biphenylyl substituted by a group other than tetrazolyl, and when A is quinolyl substituted by lower alkyl, R^2 is an optionally substituted phenyl, optionally substituted naphthyl, optionally substituted heterocyclic group or substituted biphenylyl,~~

~~the substituent for the above-mentioned phenyl, naphthyl and heterocyclic group being at least one member selected from the group consisting of alkyl, cyclo(lower)alkyl, alkenyl, alkynyl, lower alkenyl, lower alkoxy, phenyl, heterocycle(lower)alkyl, halogen, amino, lower alkanoylamiono, mono(lower)alkylamino, di(lower)alkylamino, N-(lower)alkyl-N-acylamino, lower alkylsulfonylamino, aryl(lower)alkylamino, N-heterocycle-N-(lower)alkylamino, arylsulfonylamino, arylcarbonylamino, lower alkylsulfonyl, lower alkylsulfinyl, lower alkylthio, cyano, carboxy, protected carboxy, carbamoyl, mono(lower)alkylcarbamoyl, di(lower)alkylcarbamoyl, nitro, halo(lower)alkyl,~~

~~aryl(lower)alkyl, aryl(lower)alkenyl, aryl(lower)alkoxy, lower alkanoylamino(lower)alkoxy, mono(lower)alkylamino(lower)alkoxy, di(lower)alkylamino(lower)alkoxy, N-(lower)alkyl-N-acylamino(lower)alkoxy, lower alkylsulfonylamino(lower)alkoxy, aryl(lower)alkylamino(lower)alkoxy, N-heterocycle-N-(lower)alkylamino(lower)alkoxy, arylsulfonylamino(lower)alkoxy, arylcarbonylamino(lower)alkoxy, cyclo(lower)alkyl(lower)alkoxy, cyclo(lower)alkyl(lower)alkyl, aryloxy(lower)alkyl, acyloxy(lower)alkyl, hydroxy(lower)alkyl, mono- or di(lower)alkylamino(lower)alkyl, aryl(lower)alkoxy(lower)alkyl, arylthio(lower)alkyl, heterocycle(lower)alkoxy, heterocycle-oxy(lower)alkyl, aryl(lower)alkylthio, arylureido, lower alkoxy(lower)alkoxy, aryl(lower)alkynyl, alkyl substituted by optionally substituted divalent heterocyclic group and optionally substituted heterocyclic group, the substituent for the above-mentioned biphenylyl being at least one member selected from the group consisting of alkyl, cyclo(lower)alkyl, alkenyl, alkynyl, lower alkanoyl, lower alkoxy, phenyl, heterocycle(lower)alkyl other than substituted tetrazolylmethyl, halogen, amino, lower alkanoylamino, mono(lower)alkylamino, di(lower)alkylamino, N-(lower)alkyl-N-acylamino, lower alkylsulfonylamino, aryl(lower)alkylamino, N-heterocycle-N-(lower)alkylamino, arylsulfonylamino, arylcarbonylamino, lower alkylsulfonyl, lower alkylsulfonyl, lower alkylthio, cyano, carbamoyl, mono(lower)alkylcarbamoyl, di(lower)alkylcarbamoyl, nitro, halo(lower)alkyl, aryl(lower)alkyl, aryl(lower)alkenyl, aryl(lower)alkoxy, lower alkanoylamino(lower)alkoxy, mono(lower)alkylamino(lower)alkoxy, di(lower)alkylamino(lower)alkoxy, N-(lower)alkyl-N-acylamino(lower)alkoxy, lower alkylsulfonylamino(lower)alkoxy, aryl(lower)alkylamino(lower)alkoxy, N-heterocycle-N-(lower) alkylamino(lower)alkoxy, arylsulfonylamino(lower)alkoxy, arylcarbonylamino(lower)alkoxy, cyclo(lower)alkyl(lower)alkoxy, cyclo(lower)alkyl(lower)alkyl, aryloxy(lower)alkyl, acyloxy(lower)alkyl, hydroxy(lower)alkyl, mono- or di(lower)alkylamino(lower)alkyl,~~

~~aryl(lower)alkoxy(lower)alkyl, arylthio(lower)alkyl, heterocycle(lower)alkoxy, heterocycle-oxy(lower)alkyl, aryl(lower)alkylthio, arylureido, lower alkoxy(lower)alkoxy, aryl(lower)alkynyl, lower alkyl substituted by optionally substituted divalent heterocyclic group and optionally substituted heterocyclic group, and~~

wherein the above-mentioned heterodicyclic group ~~means the following (A) to (T):~~

~~(A) saturated or unsaturated 7- to 12-membered heterobicyclic group having 1 to 4 nitrogen atoms~~

~~(B) saturated or unsaturated 7- to 12-membered heterobicyclic group having 1 to 3 oxygen atoms~~

~~(C)~~ is a saturated or unsaturated 7- to 12-membered heterobicyclic group having 1 to 3 sulfur atoms,

~~(D) saturated or unsaturated 7- to 12-membered heterobicyclic group having 1 to 3 nitrogen atoms and 1 or 2 oxygen atoms~~

~~(E) saturated or unsaturated 7- to 12-membered heterobicyclic group having 1 to 3 nitrogen atoms and 1 or 2 sulfur atoms~~

~~(F) saturated or unsaturated 7- to 12-membered heterobicyclic group having 1 or 2 oxygen atoms and 1 or 2 sulfur atoms~~

~~(G) saturated or unsaturated 7- to 12-membered heterobicyclic group having 1 nitrogen atom, 1 oxygen atom and 1 sulfur atom~~

~~(H) saturated or unsaturated 7- to 12-membered heterobicyclic group having 1 or 2 selenium atoms~~

~~(I) saturated or unsaturated 7- to 12-membered heterobicyclic group having 1 or 2 selenium atoms and 1 to 3 nitrogen atoms~~

~~(J) unsaturated 3- to 8-membered heteromonocyclic group having 1 to 4 nitrogen atoms~~

~~(K) saturated 3- to 8-membered heteromonocyclic group having 1 to 4 nitrogen atoms~~

~~(L) unsaturated 3- to 8-membered heteromonocyclic group having 1 or 2 oxygen atoms and 1 to 3 nitrogen atoms~~

~~(M) saturated 3- to 8-membered heteromonocyclic group having 1 or 2 oxygen atoms and 1 to 3 nitrogen atoms~~

~~(N) unsaturated 3- to 8-membered heteromonocyclic group having 1 or 2 sulfur atoms and 1 to 3 nitrogen atoms~~

~~(O) saturated 3- to 8-membered heteromonocyclic group having 1 or 2 sulfur atoms and 1 to 3 nitrogen atoms~~

~~(P) unsaturated 3- to 8-membered heteromonocyclic group having 1 or 2 sulfur atoms~~

~~(Q) unsaturated 3- to 8-membered heteromonocyclic group having 1 or 2 oxygen atoms~~

~~(R) unsaturated 3- to 8-membered heteromonocyclic group having 1 oxygen atom~~

~~(S) spiroheterocyclic group having 1 or 2 oxygen atoms~~

~~(T) unsaturated 3- to 8-membered heteromonocyclic group having 1 oxygen atom and 1 or 2 sulfur atoms,~~

or a salt thereof.

Claim 4 (Currently Amended): The sulfonamide compound of claim 3, wherein A is a hetero<u>di</u>cyclic group selected from the group consisting of ~~2,3-dihydrobenzimidazolyl, pyrazolopyrimidinyl, tetrahydropyrazolopyrimidinyl, imidazopyrazolyl, dihydroimidazopyrazolyl, imidazopyridyl, pyrrolopyridyl, pyrazolopyridyl, benzopyrazolyl, dihydrobenzimidazolyl, benzotriazolyl, indolizinyl, isoindolyl, indazolyl, indolinyl, isoindolinyl, purinyl, quinolizinyl, isoquinolyl, quinolyl, phthalazinyl, naphthalidinyl,~~

~~quinoxalinyl, dihydroquinoxalinyl, tetrahydroquinoxalinyl, quinazolinyl, dihydroquinazolinyl, tetrahydroquinazolinyl, cinnolinyl, pteridinyl, pyrazinopyridazinyl, imidazotriazinyl, imidazopyrazinyl, imidazopyrimidinyl, imidazopyridazinyl, 1H-1-(or 2)pyrinedinyl, benzofuranyl, isobenzofuranyl, furopyridyl, chromenyl, chromanyl, isochromanyl, benzoxepinyl, cyclopentapyranyl, furopyranyl,~~ benzothiophenyl, dihydrodithianaphthalenyl, and dithianaphthalenyl, ~~dioxoloimidazolyl, benzoxazinyl, pyridoxazinyl, pyrazolooxazolyl, furopyridyl, thienoimidazolyl, thienopyridyl, dithiadiazaindanyl, thienofuranyl, oxathiolopyrrolyl, benzoselenophenyl, selenopyridyl, benzoselenol, selenopyridyl and cyclopentadienopyridyl, and said heterocyclic groups are~~ which may be optionally substituted by at least one member selected from the group consisting of lower alkyl and oxo,

or a salt thereof.

Claim 5 (Currently Amended): The sulfonamide compound of claim 4, wherein,

R^1 is an alkyl, an alkenyl, a phenyl(lower)alkenyl, a quinolyl, a phenyl optionally substituted by a substituent selected from the group consisting of nitro, alkyl and alkenyl or a thienyl optionally substituted by halogen;

A is ~~a heterocyclic group selected from the group consisting of 2,3-dihydrobenzimidazolyl, imidazopyrazolyl, imidazopyridyl, pyrrolopyridyl, pyrazolopyridyl, benzotriazolyl, indolizinyl, indazolyl, quinolyl, dihydroquinoxalinyl, tetrahydroquinoxalinyl, dihydroquinazolinyl, tetrahydroquinazolinyl, benzofuranyl,~~ benzothiophenyl ~~and thienoimidazolyl, said heterocyclic group being~~ which is optionally substituted by alkyl or oxo;

X is a lower alkylene, an oxa(lower)alkylene or an oxa; and

R^2 is a phenyl optionally substituted by a substituent selected from the group consisting of alkyl, alkenyl, alkynyl, lower alkanoyl, lower alkoxy, phenyl, imidazolyl(lower)alkyl, piperidinyl(lower)alkyl, halogen, amino, lower alkanoylamino, mono(lower)alkylamino, di(lower)alkylamino, N-(lower)alkyl-(lower)alkanoylamino, N-(lower)alkyl-N-benzoylamino, lower alkylsulfonylamino, phenyl(lower)alkylamino, phenylsulfonylamino, benzoylamino, lower alkylsulfonyl, lower alkylsulfmyl, lower alkylthio, cyano, carboxy, lower alkoxycarbonyl, cyclo(lower)alkyloxycarbonyl, mono(lower)alkylcarbamoyl, nitro, halo(lower)alkyl, phenyl(lower)alkyl, phenyl(lower)alkenyl, phenyl(lower)alkoxy, (N-pyridyl-N-(lower)alkylamino)(lower)alkoxy, cyclo(lower)alkyl(lower)alkoxy, cyclo(lower)alkyl(lower)alkyl, phenoxy(lower)alkyl, lower alkylsulfonyloxy(lower)alkyl, hydroxy(lower)alkyl, di(lower)alkylamino(lower)alkyl, phenyl(lower)alkoxy(lower)alkyl, phenylthio(lower)alkyl, thienyl(lower)alkoxy, pyridyloxy(lower)alkyl, phenyl(lower)alkylthio, phenylureido, lower alkoxy(lower)alkoxy, phenyl(lower)alkynyl, dioxothiazolidylidene(lower)alkyl and thienyl optionally substituted by halogen; naphthyl optionally substituted by halogen; a 4-phenylphenyl substituted by halogen; a thienyl optionally substituted by halogen; a benzothienyl optionally substituted by halogen; a quinolyl optionally substituted by halogen; or a benzooxolanyl optionally substituted by halogen,

or a salt thereof.

Claim 6 (Currently Amended): The sulfonamide compound of claim 5, wherein,

R^1 is an alkyl, an alkenyl, a phenyl(lower) alkenyl, a phenyl optionally substituted by a substituent selected from the group consisting of alkyl and alkenyl or a thienyl optionally substituted by halogen;

A is ~~a heterocyclic group selected from the group consisting of 3H-imidazo[4,5-b]pyridyl, pyrazolo[1,5-a]pyridyl, indolizinyl, 1H-indazolyl, benzo[b]furanyl and~~ benzo[b]thiophenyl~~, said heterocyclic group being~~ which is optionally substituted by one or two alkyl;

X is an alkylene; and

R^2 is a phenyl optionally substituted by a substituent selected from the group consisting of alkyl, alkenyl, alkynyl, lower alkoxy, phenyl, halogen, di(lower)alkylamino, lower alkylthio, lower alkoxycarbonyl, nitro, halo(lower)alkyl, phenyl(lower)alkyl, phenyl(lower)alkenyl, phenyl(lower)alkoxy, cyclo(lower)alkyl(lower)alkoxy, phenoxy(lower)alkyl, phenyl(lower)alkoxy(lower)alkyl, phenyl(lower)alkynyl and thienyl optionally substituted by halogen; a naphthyl optionally substituted by halogen; or a 4-phenylphenyl substituted by halogen,

or a salt thereof.

Claim 7 (Currently Amended): The sulfonamide compound of claim 4 ~~6~~, wherein~~,~~

A is ~~a 3H-imidazo[4,5-b]pyridyl, a 1H-indazolyl or a benzo[b]furanyl, these heterocyclic groups being~~ benzothiophenyl, dihydrodithianaphthalenyl, or dithianaphthalenyl, which is optionally substituted by alkyl; and

R^2 is a phenyl substituted by halogen, said phenyl being optionally substituted by a substituent selected from the group consisting of alkyl, alkenyl, alkenyl, lower alkoxy, phenyl, halogen, di(lower)alkylamino, lower alkylthio, lower alkoxycarbonyl, nitro, halo(lower)alkyl, phenyl(lower)alkyl, phenyl(lower)alkenyl, phenyl(lower)alkoxy, cyclo(lower)alkyl(lower)alkoxy, phenoxy(lower)alkyl, phenyl(lower)alkoxy(lower)alkyl, phenyl(lower)alkynyl and thienyl optionally substituted by halogen, or a naphthyl substituted by halogen,

or a salt thereof.

Claim 8 (Currently Amended): The sulfonamide compound of claim 7, wherein A is benzothiophenyl, dihydrodithianaphthalenyl, or dithianaphthalenyl, which is ~~3H-imidazo[4,5-b]pyridyl~~ substituted by 1 or 2 lower alkyl, or a salt thereof.

Claim 9 (Currently Amended): The sulfonamide compound of claim 7, wherein A is 1~~-H-indazolyl~~ benzothiophenyl, dihydrodithianaphthalenyl, or dithianaphthalenyl substituted by one lower alkyl, or a salt thereof.

Claim 10 (Currently Amended): The sulfonamide compound of claim 7, wherein A is ~~benzo[b]furanyl~~ benzothiophenyl substituted by one lower alkyl, or a salt thereof.

Claim 11 (Currently Amended): A method for producing a compound of the formula (I)

$$R^1\text{-}SO_2NHCO\text{-}A\text{-}X\text{-}R^2 \quad (I)$$

wherein

R^1 is an optionally substituted alkyl, an optionally substituted alkenyl, an optionally substituted alkynyl, an optionally substituted cyclo(lower)alkyl, an optionally substituted aryl or an optionally substituted heterocyclic group;

A is an optionally substituted heteropolycyclic group in which sulfur is the only heteroatom(s) ~~except benzimidazolyl, indolyl, 4,7-dihydrobenzimidazolyl and 2,3-dihydrobenzoxazinyl~~;

X is an alkylene, an oxa, an oxa(lower)alkylene, a lower alkylene-oxa, a carbonyl, a lower alkenylene, an optionally substituted imino, an optionally N-

substituted imino(lower)alkylene, an N substituted lower alkyleneimino, a thioxa(lower)alkylene or a lower alkylenethioxa; and

R^2 is an optionally substituted aryl, an optionally substituted heterocyclic group or a substituted biphenylyl;

~~provided that when A is 3H-imidazo[4,5-b]pyridyl substituted by lower alkyl, R^2 is an optionally substituted aryl, an optionally substituted heterocyclic group or a biphenylyl substituted by a group other than tetrazolyl, and when A is quinolyl substituted by lower alkyl, R^2 is an optionally substituted aryl, an optionally substituted heterocyclic group, or a biphenylyl substituted by at least one group selected from the group consisting of alkyl, cyclo(lower)alkyl, alkenyl, alkynyl, lower alkanoyl, lower alkoxy, phenyl, heterocycle(lower)alkyl other than substituted tetrazolylmethyl, halogen, amino, substituted amino, lower alkylsulfonyl, lower alkylsuffinyl, lower alkylthio, cyano, carbamoyl, mono(lower)alkylcarbamoyl, di(lower)alkylcarbamoyl, nitro, halo(lower)alkyl, aryl(lower)alkyl, aryl(lower)alkenyl, aryl(lower)alkoxy, lower alkoxy substituted by substituted amino, cyclo(lower)alkyl(lower)alkoxy, cyclo(lower)alkyl(lower)alkyl, aryloxy(lower)alkyl, acyloxy(lower)alkyl, hydroxy(lower)alkyl, mono- or di(lower)alkylamino(lower)alkyl, aryl(lower)alkoxy(lower)alkyl, arylthio(lower)alkyl, heterocycle(lower)alkoxy, heterocycle-oxy(lower)alkyl, aryl(lower)alkylthio, arylureido, lower alkoxy(lower)alkoxy, aryl(lower)alkynyl, lower alkyl substituted by optionally substituted divalent heterocyclic group and optionally substituted heterocyclic group, or a salt thereof,~~ comprising ~~the step of~~:

(1) reacting a compound of the formula (II)

$$R^1\text{-}SO_2NH_2 \qquad \text{(II)}$$

wherein each symbol is as defined above, or a salt thereof, and a compound of the formula (III)

$$HOOC\text{-}A\text{-}X\text{-}R^2 \qquad (III)$$

wherein each symbol is as defined above, or a reactive derivative thereof at carboxy or a salt thereof, to give a compound of the formula (I):

$$R^1\text{-}SO_2NHCO\text{-}A\text{-}X\text{-}R^2 \qquad (I)$$

wherein each symbol is as defined above, or a salt thereof; or

(2) reducing a compound of the formula (I-1):

$$R^1\text{-}SO_2NHCO\text{-}A\text{-}X\text{-}R^{201} \qquad (I\text{-}1)$$

wherein R^{201} is an optionally substituted aryl, an optionally substituted heterocyclic group or a substituted biphenylyl, all of which having at least alkynyl, aryl(lower)alkenyl, terminal nitro or terminal formyl and other symbols are as defined above, or a salt thereof, to give a compound of the formula (I-2):

$$R^1\text{-}SO_2NHCO\text{-}A\text{-}X\text{-}R^{202} \qquad (I\text{-}2)$$

wherein R^{202} is an optionally substituted aryl, an optionally substituted heterocyclic group or a substituted biphenylyl, all of which having at least alkyl, aryl(lower)alkyl, terminal amino or hydroxymethyl, and other symbols are as defined above, or a salt thereof; or

(3) oxidizing a compound of the formula (I-3):

$$R^1\text{-}SO_2NHCO\text{-}A\text{-}X\text{-}R^{203} \qquad (I\text{-}3)$$

wherein R^{203} is an optionally substituted aryl, an optionally substituted heterocyclic group or a substituted biphenylyl, all of which having at least terminal formyl, and other symbols are as defined above, or a salt thereof, to give a

compound of the formula (I-4):

$$R^1\text{-}SO_2NHCO\text{-}A\text{-}X\text{-}R^{204} \qquad (I\text{-}4)$$

wherein R^{204} is an optionally substituted aryl, an optionally substituted heterocyclic group or a substituted biphenylyl, all of which having at least carboxy, and other symbols are as defined above, or a salt thereof; or

(4) acylating a compound of the formula (I-5):

$$R^1\text{-}SO_2NHCO\text{-}A\text{-}X\text{-}R^{205} \qquad (I\text{-}5)$$

wherein R^{205} is an optionally substituted aryl, an optionally substituted heterocyclic group or a substituted biphenylyl, all of which having at least hydroxy(lower)alkyl, and other symbols are as defined above, or a salt thereof, to give a compound of the formula (I-6):

$$R^1\text{-}SO_2NHCO\text{-}A\text{-}X\text{-}R^{206} \qquad (I\text{-}6)$$

wherein R^{206} is an optionally substituted aryl, an optionally substituted heterocyclic group or a substituted biphenylyl, all of which having at least acyloxy(lower)alkyl, and other symbols are as defined above, or a salt thereof; or (5) introducing an aryloxy group into a compound of the formula (I-6):

$$R^1\text{-}SO_2NHCO\text{-}A\text{-}X\text{-}R^{206} \qquad (I\text{-}6)$$

wherein each symbol is as defined above, or a salt thereof, to give a compound of the formula (I-7):

$$R^1\text{-}SO_2NHCO\text{-}A\text{-}X\text{-}R^{207}$$

wherein R^{207} is an optionally substituted aryl, an optionally substituted heterocyclic group or a substituted biphenylyl, all of which having at least aryloxy(lower)alkyl, and other symbols are as defined above, or a salt thereof; or (6) introducing a carboxy-protecting group into a compound of the formula (1-4):

$$R^1\text{-}SO_2NHCO\text{-}A\text{-}X\text{-}R^{204} \qquad (I\text{-}4)$$

wherein each symbol is as defined above, or a reactive derivative thereof, to give a compound of the formula (1-8):

$$R^1\text{-}SO_2NHCO\text{-}A\text{-}X\text{-}R^{208} \qquad (I\text{-}8)$$

wherein R^{208} is an optionally substituted aryl, an optionally substituted heterocyclic group or a substituted biphenylyl, all of which having at least protected carboxy, and other

symbols are as defined above, or a salt thereof; or (7) amidating a compound of the formula (I-4):

$$R^1\text{-}SO_2NHCO\text{-}A\text{-}X\text{-}R^{204} \qquad (I\text{-}4)$$

wherein each symbol is as defined above, or a reactive derivative thereof, to give a compound of the formula (I-9):

$$R^1\text{-}SO_2NHCO\text{-}A\text{-}X\text{-}R^{209} \qquad (I\text{-}9)$$

wherein R^{209} is an optionally substituted aryl, an optionally substituted heterocyclic group or a substituted biphenylyl, all of which having at least optionally substituted amide, and other symbols are as defined above, or a salt thereof; or

(8) adding a nitrogen-containing heterocyclic group to a compound of the formula (I-10):

$$R^1\text{-}SO_2NHCO\text{-}A\text{-}X\text{-}R^{210} \qquad (I\text{-}10)$$

wherein R^{210} is an optionally substituted aryl having at least a halogen atom, and other symbols are as defined above, or a salt thereof, to give a compound of the formula (I-11):

$$R^1\text{-}SO_2NHCO\text{-}A\text{-}X\text{-}R^{211} \qquad (I\text{-}11)$$

wherein R^{211} is an aryl substituted by at least heterocyclic group having nitrogen, and other symbols are as defined above, or a salt thereof.

Claim 12 (Original): A pharmaceutical composition comprising the sulfonamide compound of claim 1 or a pharmaceutically acceptable salt thereof.

Claim 13 (Currently Amended): A method for treating a disease treatable based on a blood sugar level-depressing activity or a disease treatable based on a cGMP-PDE inhibiting activity, smooth muscle relaxing activity, bronchodilating activity, vasodilating activity, smooth muscle cell suppressing activity or antiallergic activity, ~~by the use of~~ comprising

administering to a subject in need thereof an amount of the sulfonamide compound of claim 1 or a pharmaceutically acceptable salt thereof effective to treat said disease.

Claim 14 (Currently Amended): A method for producing a therapeutic agent comprising:

admixing the sulfonamide compound of claim 1 with a pharmaceutically acceptable carrier or excipient ~~use of the sulfonamide compound of claim 1 or a pharmaceutically acceptable salt thereof for the production of a therapeutic agent for a disease treatable based on a blood sugar level-depressing activity, or a disease treatable based on a cGMP-PDE inhibiting activity, smooth muscle relaxing activity, bronchodilating activity, vasodilating activity, smooth muscle cell suppressing activity or antiallergic activity~~.

Claim 15 (New) A method for reducing the level of blood sugar comprising:

administering an effective amount of the sulfonamide compound of claim 1 or a pharmaceutically acceptable salt thereof to a subject in need thereof for a time and under conditions effective to reduce the level of blood sugar.

Claim 16 (New) A method for inhibiting cGDP-PDE activity comprising:

administering an effective amount of the sulfonamide compound of claim 1 or a pharmaceutically acceptable salt thereof to a subject in need thereof for a time and under conditions effective to inhibit cGDP-PDE activity.

Claim 17 (New) A method for relaxing smooth muscle, inducing bronchodilation, inducing vasodilation, suppressing smooth muscle cell activity or inducing antiallergic activity comprising:

administering an effective amount of the sulfonamide compound of claim 1 or a pharmaceutically acceptable salt thereof to a subject in need thereof for a time and under conditions effective to relax smooth muscle, induce bronchodilation, induce vasodilation, suppress smooth muscle cell activity or induce antiallergic activity.

Claim 18 (New) The composition of claim 12 that is in a form suitable for oral, parenteral, external, or local administration.

Claim 19 (New) The composition of claim 12 that is in the form of a capsule, tablet, sugar-coated tablet, granule, suppository, liquid, solvate, lotion, suspension, emulsion, ointment, or gel.

Claim 20 (New) The composition of claim 12, further comprising an adjuvant auxiliary, auxiliary substance, stabilizer, moistening agent, emulsifier, or buffering agent.